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Teacher Development

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t716100723>

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Online Publication Date: 01 February 2009

To cite this Article Colcott, Dawn, Russell, Bernadette and Skouteris, Helen(2009)'Thinking about thinking: innovative pedagogy designed to foster thinking skills in junior primary classrooms',Teacher Development,13:1,17 — 27

To link to this Article: DOI: 10.1080/13664530902858477

URL: <http://dx.doi.org/10.1080/13664530902858477>

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Thinking about thinking: innovative pedagogy designed to foster thinking skills in junior primary classrooms

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(Received 30 August 2007; final version received 17 December 2008)

This article reports on the collaborative initiative of two primary school teachers who created and implemented innovative pedagogy in order to foster a culture of thinking in their classrooms. The paper outlines teaching strategies that were used with the intent of making students mindful of themselves as learners and thinkers. A 'Toolbox', inspired by 'Habits of Mind' and the Visible Thinking approach to teaching and learning, is described in narrative form by one of the teachers. The Toolbox aims to equip students with the thinking tools to make their thinking visible to themselves, their peers and their teachers.

Keywords: Visible Thinking; metacognition; action research; thinking dispositions; mindfulness

Successful learning at school is the foundation of lifelong learning by individuals and the globalised, knowledge society of the future. (Skilbeck and Connell 2004, 7)

Learning is the outcome that all good teachers should strive for. Whilst there has been an abundance of research and literature on the topic of student learning, it has only been in more recent times that the issue of teacher learning has been considered by researchers (see Beijaard, Korthagen, and Verloop 2007). Learning by students and teachers is inextricably linked; enhanced knowledge and advanced skills in teachers are resources for fostering student learning (Chapman et al. 2003). It is not surprising therefore, that there is now an advance toward establishing learning communities within schools whereby teacher collaboration is developed and nurtured; collaboration in turn creates a powerful professional development environment for teachers and hence a powerful environment for teacher learning (Sawyer and Rimm-Kaufman 2007).

This article reports on the collaborative initiative of two primary (elementary) school teachers who created and implemented innovative pedagogy that they believe has fostered a culture of thinking in their classrooms. Bernadette is a first-year (preparatory, children aged 5–6 years) teacher and Dawn a composite Grade 1/2 (children aged 6–8 years) teacher. Both teachers have taught all primary year levels, with over 60 years of cumulative teaching experience between them. What follows is a descriptive account of their journey toward converting their classrooms into 'visible thinking' classrooms.

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Background

For any type of innovative pedagogy to be created in a school environment two things are needed: the wholehearted support of the principal and the commitment of staff to professionally develop themselves and continue learning (Del Gaudio Calyton and Schoonmaker 2007). There is a real commitment to professional development in Dawn and Bernadette's primary school. The commitment is realized by the formation of professional learning teams across academic year levels in the school and the support, financially and administratively, in terms of time release, for teachers to work collaboratively, within or across learning teams, on action research. Action research is used by teachers to gain insight into their practice; by reflecting on information they gather through systematic investigation, they can then develop ways to improve the work they do as teachers (Ponte, Beijard, and Ax 2004). The school has an established and embedded research culture (Ebbutt 2002), with all learning teams involved in action research that is documented formally and reported to the staff at large as professional development.

It was this culture of performance and development that resulted in Dawn and Bernadette attending the 12th International Conference on Thinking, held in Melbourne, Australia in July 2005. This conference was the impetus to the pedagogy that is described here. Whilst both teachers had begun to consider innovative ways to encourage higher order thinking in their children, the presentations at the conference inspired them to reflect further on their practice and consider new and potentially more effective ways to do this.

Thinking skills

Sociocultural theories of cognitive development propose that children's cognitive development is influenced by their social interactions with parents, siblings, peers, teachers, and others in their social environment (Siegler and Alibali 2005). However, it is not the case that children are empty vessels, waiting to be filled with knowledge by those around them. On the contrary, we know that even young infants are cognitively competent and that they perceive the world and classify their experiences in similar ways to older children and adults (see Baillargeon 1994; Spelke and Newport 1998). A teacher's role within the authors' state-based curriculum (Victoria, Australia) is therefore to foster cognitive development by scaffolding children's learning and hence fuel their natural curiosity. In order to achieve learning outcomes, it is now argued that teachers 'must actively inquire into students' thinking, creating classroom tasks and conditions under which student thinking can be revealed' (Donovan, Bransford, and Pellegrino 1999, 14). By 'seeing' and understanding how children operate when thinking, teachers are more likely to uncover each child's unique capabilities, understandings, motivations, and prior knowledge. A critical feature of effective teaching is that children's preconceptions of a subject matter are elicited from students; teachers need to recognize preconceptions that make the learning of a topic difficult for students, draw out unpredictable preconceptions, and then work with preconceptions to allow students to build on their understanding, challenge it and even revise or replace pre-existing understanding if so required (Donovan, Bransford, and Pellegrino 1999).

Hence, Dawn and Bernadette became aware that the more students are mindful of how and when they think, the more control they have over their own learning. They wanted to give their students that control, to support and scaffold their thinking

actions and to foster more sophisticated higher order thinking skills. However, the goal of teaching students to be good thinkers is not achieved by just presenting them with thinking skills alone, but rather by 'teaching students to be disposed to think creatively and critically in appropriate contexts' (Tishman, Jay, and Perkins 1993, 147). Moreover, Fogarty (2005) argues that teachers set the climate for thinking by teaching the skills and concepts of thinking, structuring interaction with thinking, and by thinking about thinking. So Dawn and Bernadette needed first to understand how they actually *teach* students the skills and concepts of thinking. In order to achieve this goal, they sought to develop a collaborative relationship with their students. Collaboration in a teaching setting is effectual when the more expert partner (usually the teacher) engages the less expert partner and involves them in the problem-solving processes (Siegler and Alibali 2005). This type of collaboration engages students in metacognitive thinking and provides the scaffolding that supports learning when students cannot proceed on their own (Lin and Lehman 1999; Palinscar and Brown 1984). 'Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them ... For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact' (Flavell 1976, 232). It has been argued that using pedagogical techniques that prompt children to consider and explain their thinking allows them to become aware of their learning and hence reflect, examine, and revise their understandings as required; this is the foundation of metacognitive theory (Brown et al. 1983; Lin and Lehman 1999).

Dawn and Bernadette were also inspired by Costa and Kallick's (2000) 16 'Habits of Mind' when developing their collaboration with students and their teaching of metacognitive skills and by the work of researchers in the USA who were exploring ways of making students' thinking visible. Given that as teachers, they cannot always know what and how children are thinking, Dawn and Bernadette wanted to overcome this problem and establish classroom routines that made the children's thinking visible to themselves, their peers, and to the teacher.

Visible Thinking

Our thoughts are mostly invisible to ourselves and to others. When we think through a problem or consider what we might write in a story we do not always reveal the sequence of thoughts and 'internal discussions' we have that enables us to achieve our outcome. Yet Perkins (2003) makes the point that much of what we learn reflects what we see others doing around us. One could not learn a sport if the instructions for that sport were not made very visible by the coach or more expert players. Hence, given thinking is mostly invisible, Perkins argues that we must develop ways of making it visible to our students when they are 'learning to think'.

Ritchhart et al. (2006) outline strategies that can be used by teachers to engage students in deeper thinking of subject matter and these strategies are based on Tishman, Jay, and Perkins' (1993) enculturation model that focuses on building a culture of thinking in the classroom by cultivating good thinking dispositions in students. The strategies that Ritchhart et al. outline are thinking routines that can be used by teachers in much the same way as they use 'housekeeping routines' to ensure a degree of structure and order in their classroom. For example, Bernadette requires that her students pack up materials upon completion of an activity before they commence another activity; after an orientation period of being introduced to such a housekeeping routine,

her students do this without having to be asked. Many different thinking routines have been developed which target different types of thinking. Examples include 'Think-Pair-Share' (reasoning and explanation), 'See-Think-Wonder' (exploring interesting things), 'What makes you say that?' (interpretation with justification). Thinking routines are unique in that they can be used across a variety of grade levels, subject areas and contexts, are modifiable so that they fit with the teacher's goals, and can be used both by the individual student and by a group of students (Ritchhart et al. 2006). Hence, by using thinking routines students should become more aware that learning is about doing, becoming personally involved, setting one's own goals, sharing ideas with others and thinking about thinking. This awareness may not come independently. Whilst we acknowledge that approaches to thinking skills are complex, it is possible that with scaffolded guidance by the teacher children may be better able to make an informed choice about which thinking routine will best suit the task at hand (that is, how and when to use these routines in the classroom). Dawn and Bernadette incorporated this scaffolded guidance into the pedagogy described below.

In what follows we present Bernadette's account of pedagogy designed around the pursuit of making children's thinking visible and fostering higher order thinking skills. Bernadette introduced and revised this pedagogy, in collaboration and consultation with Dawn and other colleagues, over the last two years with her preparatory class of 21 students. We present her discussion of this innovative pedagogy as a descriptive narrative below that guides the reader through Bernadette's journey. Our aim here is not to convince the reader that this type of pedagogy leads to better student outcomes; systematic and rigorous research is needed to come to such a conclusion and this research has yet to be conducted. Instead, the anecdotal evidence of a teacher with 30 years' experience and her reflections on her own teaching practice are presented in order to show how and why Bernadette implemented this innovative pedagogy in her classroom.

The Toolbox

My main goal as a teacher has always been to develop strategies that enable my students to develop ownership of their learning, to think for themselves, to reflect on what they have learnt and to be individually inspired to further their own learning. I knew that in order to achieve this goal I needed to create a classroom culture that encourages and fosters thinking. As a junior primary school teacher of many years, I have no doubt that these formative years are crucial for developing students' inclinations toward thinking critically and creatively; given the right thinking tools, thinking skills can be taught and I believe I have shown this to be the case even with 5 to 6 year-olds in the first year of formal schooling. I will guide you through the pedagogical steps that have enabled me to develop what I consider to be a 'visible thinking' classroom and a culture within that is based on shared responsibility for learning.

The more simple thinking routines, such as 'See-Think-Wonder', K-W-L (Ogle 1986), What do you *know*? What do you *want* to know? What have you *learnt*?, can be used effectively with younger children. I have used these thinking routines with and taught them to my students over the last three years to scaffold their thinking with inquiry-based learning such as the topic of 'Mini Beasts'. Rather than generate the discussion of mini beasts myself by describing several types of insects to the children, which I had done for many years, I now allow the children themselves to generate the ideas about where *they* want this inquiry-based learning to go by asking them to pose

questions and to wonder about what they know and what they want to know. We create a mind map on the board of all the things we want to know about mini beasts and then proceed toward finding out the answers to our questions using the resources available to us – books, internet, children as experts, teacher as expert. In this way, children become the scientist; they become curious and want to explore the topic in depth and breadth. They also become adventurous wanting to look for mini beasts outside and most importantly they take responsibility for their own learning because the questions they seek answers for have been generated by themselves.

I had little doubt that by posing such questions at the outset of the inquiry-based learning module I was fostering a culture of independent and group-based thinking that directly involved the children themselves, rather than a culture of just working on a project that is largely described and initiated by me as their teacher. However, I felt that a piece of the puzzle was still missing and this piece was the link to using such thinking routines/skills as a disposition throughout the day rather than only when I formally noted that ‘inquiry-based’ learning was taking place. It struck me that *all* learning is inquiry based. That is, when children are writing their diaries during literacy they must inquire about the skills they need to do this effectively and yet children rarely do this. Every time they write we expect that they ‘sit letters on the line’, ‘use capital letters at the start of a sentence’, and so on, but this really requires them to think about their thinking – that is, they are thinking about their weekend but in so doing we also want them to simultaneously think about *how* they need to write about their weekend. However, in my years of teaching I have found that whilst you can correct the children’s work in most instances the same mistakes are repeated every time. The task of thinking about the content of writing and thinking about the expression, grammar, style of writing is challenging for younger children (and some may argue for older children!). Similarly, when doing mathematics I want the children to notice the patterns, understand the sequence of numbers, know how to write their numbers and so forth. In much the same way as writing a story, when completing a mathematics task I noticed that competing influences, in terms of thinking about the problem as well as thinking about the writing of the actual numbers and identifying patterns, were impacting on the children’s performance. Again, I was the one correcting the children; they could not self-correct or identify their errors. Hence, I began exploring ways to scaffold the children’s thinking for all the different tasks we engage in during the day and to allow them to take responsibility for their learning at the same time.

Inspired by Buzan and Buzan’s (1993) quote: ‘The only barrier to the expression and application of all our mental applications is our knowledge of how to access them’ (35), I began my journey with the analogy of the ‘filing cabinet’ with the aim of developing a powerful tool for the transference of skills from one year level to the next. Documents/information stored in a filing cabinet are labelled for quick retrieval. By using this analogy with the children, I help them to visualize where our learning for each day goes and to understand that knowledge is never lost, but rather that it is always retrievable because it has just been ‘filed away’. Indeed, I have also created a cartoon depiction of a filing cabinet in our brains and display this, on one of the classroom walls, as a visual prompt for the children. I then discuss the process of re-using information (prior knowledge) at different stages of the day to allow for retention of information or skills. So children understand that when we learn something, we need to file it away in the Filing Cabinet in our brains for future use, perhaps in the next year level and maybe beyond; they also understand they can keep adding to a file by

retrieving the information already stored and building upon it, making the file larger and more detailed.

I believe that the 'filing cabinet' analogy has been effective. This was the first insight I had into how powerful Visible Thinking can be for children. Children confidently use terms such as 'prior knowledge' when asked to reflect on what they might need to complete a task successfully. It also helps them to verbalise learning difficulties to their teacher or to their peers, such as one child who could not remember his sight words saying: 'I can't open my filing cabinet today; it is stuck!' However, I felt that something more concrete and visible was needed. I proposed that children's thinking may be facilitated by making the tools to writing/mathematics visible to them so they can use them to reflect on what they have written and what revisions need to be made. Consequently, the 'filing cabinet' developed into our Toolbox pedagogy. The Toolbox is a collection of skills/tools to be used by children at all times when problem solving and creative thinking are required. The tools are printed on cards and kept in a plastic folder. Students keep their own individual Toolboxes in their lockers and add tools/skills when introduced to them and retrieve these on a daily basis when they are needed. A large, class set of tools and a large Toolbox is on display in the classroom and referred to daily by me and students (see Figure 1).

Hence, the Toolbox is filled with a range of multi-functional tools that encourage independent learning and thought. When working with younger children these tools need to be: visual; tactile; simple, descriptive symbols that children respond to; reflected on every day as part of class discussions; easily accessible; and valued by each child. The tools are negotiated by the children and then go into their own personal Toolbox. Some of the tools can also be handwritten or drawn by the children to build ownership of the process. I always preface the discussion of any classroom task with the question: 'What tools are we using today?' (see Figure 2). Children are able to identify the key skills and understandings needed quickly, such as 'pencil grip' and 'sitting letters on the line' for writing, and 'number patterns' and 'two odd numbers make an even number' for mathematics.

Our Toolboxes include the following tools (see Figure 3). However, given that the children's sense of ownership is high, the children themselves add tools as they



Figure 1. The class Toolbox used by the teacher to demonstrate the contents to children. Photo © 2007 Bernadette Russell.



Figure 2. A demonstration of tools identified by children in a preparatory class. Photo © 2007 Bernadette Russell.

become needed and can tailor their individual Toolboxes to meet their level of academic ability.

It quickly became very clear to me that the Toolbox was valuable in the promotion of a culture of thinking in the classroom, rather than just being a means to transfer skills to the next year level. The children love the visual and explicit language of the tools. They also love to physically move them around. The Toolbox has become a consistent thinking routine of the day that helps them to reflect on what is expected of them and how they can proceed with the task at hand. The Toolbox also allows me to prompt children about the use of highly valuable thinking tools such as mind mapping and flow charts. The children's thoughts are first mapped out visually by use of drawings or keywords in a sequential manner and then individually or together with the teacher they can expand on their initial thoughts to produce more detailed writing; thoughts presented as a mind or flow chart provide a very visual medium for the teacher and students to work with. Students can then reflect on the product of their work ensuring

❖ VALUES

School Values.
I-Care rules (Peace-Making program)
Class Rules – cooperation, inclusivity, sharing, behaviour.
Home Rules
Habits of Mind

❖ ACADEMIC

Letters of the alphabet
Numerals
4 processes
Mathematical symbols
Punctuation
Grammar

Handwriting – formation of letters, directionality, pencil grip.
Fine and gross motor techniques.
Questioning skills

❖ THINKING TOOLS

Graphic organizers – brain maps, Venn diagrams, spider maps.
Thinker's keys
Debono's hats
Bloom's Taxonomy – discovering their own Learning style
Questioning
Goal setting – Bricks on the back of Toolbox
Self-assessment and reflection

Figure 3. Tools included in our Toolboxes.

that rules of literacy or numeracy are adhered to (e.g. using capital letters at the beginning of a sentence; numbers written correctly). In this sense, assessment *for* learning is achieved, as opposed to assessment *of* learning (Black et al. 2003).

This assessment for learning in turn allows students to set their own future learning goals. Goal setting is one of the major tools used in helping children to develop reflective thought patterns on what they know and what they want to find out about. Students in my class set their own goals by reflecting on a specific learning process or strategy and discussing it with me. The goal is identified by the child as something that they need to improve upon or a specific area that they have a passion about and want to explore. Each child's goals are then transferred to the building structure on the outside of their Toolboxes. The goal is coloured in and signed off when achieved, through a self-reflective process. I have also used these goals when developing each child's Individual Learning Plan. Examples of goals include: Learning all initial sounds; Automatic response of number facts; Putting hand up before speaking (controlling impulsivity); Re-read and editing own work (Perseverance). By making these goals visible and by celebrating their achievement in a very visual way, children know when they have developed changes in skills, knowledge and values; this becomes explicit to them and children begin to understand that they *themselves* are taking responsibility for their learning. It is important to note that the Toolbox allows all children to work at their own level each day; from a teacher's perspective it allows you to reflect on each child's individual abilities in any given activity and then follow through to acknowledge their achievements however small or large a step they have made.

Here is an example of how I use the Toolbox with preparatory children to elicit writing on the topic 'Environments that families use'. I place the class tool Brain Map (in the large Toolbox that is used by me for instruction) onto the whiteboard and direct the students' attention to this. I then draw a brain map (I use brain instead of mind map because the younger children understand the word *brain* more than the word *mind*) on the whiteboard and add children's suggestions of environments and the living and non-living things they find in one of these environments (asking them to access prior knowledge from their Filing Cabinets). The activity for the children is to develop their understanding of another environment in the form of a brain map; this allows for open-ended responses and is flexible to the child's understandings and developmental stage. Once the brain map is complete (children have stopped offering suggestions), I direct them to the large class Toolbox and ask what tools they may need to use or want to use in order to write about this topic, for example, handwriting, drawing, letter/sound, Filing Cabinet. We discuss this as a class and I place the individual tools on the whiteboard so they become immediately visible. Children are then invited to work on their tables and begin writing; they take out their own individual Toolboxes from their lockers and arrange the useful tools in front of them to help them organise their thinking. There is the opportunity for a task like this to have ongoing assessment; I question the children and listen to their responses which reveals a lot about their thinking. I constantly provide feedback verbally and informally as students work through the task.

Hence, I believe that the Toolbox can be a very simple tool for the younger children but that it may also be a highly valuable tool in any grade level to develop individualized learning goals to help children be mindful of the steps they take visibly and explicitly. It provides teachers with a quick and simple way to tune children into any process in the school day. It also models positive reflections for children who need to be reminded daily about certain skills such as managing their impulsivity!

Conclusion

There is still much to do before we can say with confidence that our pedagogy is effective in terms of student outcomes. We know that there have been no obvious detrimental effects and that from an anecdotal perspective students appear to have developed ownership of their learning, think for themselves, reflect on what they have learnt and that they are individually inspired to further their own learning; all these things have happened, in our opinion, to a greater extent with the introduction of the Toolbox pedagogy than they have in prior years of our teaching experience.

To further develop and improve our pedagogy, we have now moved toward 'collaborative inquiry' (see Angelides and Gibbs 2007) whereby we have invited a *critical friend* to work with us who is an academic psychologist and an expert in cognitive development, Dr Helen Skouteris. A critical analysis of our pedagogical initiative is needed. Helen is also a parent member of the School Council at Bentleigh West Primary School; our collaboration with Helen is therefore fostering the relationship between community and school which is now recognized as a key to student engagement and moving from a teacher-centred focus to a student-centred focus that promotes relational learning (Otero 2003). Theories of learning have emphasized the importance of repetition, scaffolding guidance, reflecting on and hence constructing knowledge, multiple intelligences, social cognition, and metacognition. Whilst Helen immediately identified that the pedagogy we outlined here draws on all these aspects of learning but in particular on seeing the child with a cultural context – the classroom – and drawing on the skills of repetition, scaffolding, self-reflection, and personal investment to facilitate metacognition and thinking skills in children, she is currently working collaboratively with us to help us to investigate our own practice with the sole aim to improve what we do for better professional (teacher/student) outcomes.

We needed to affirm our interpretation of observations in the classroom with 'real' data and show that our preconceptions about the usefulness of this pedagogy are not impacting our view of what we see happening in the classroom. In short, we needed to produce an objective, as opposed to subjective, measure of the effectiveness of the pedagogy we have created in terms of student learning. This investigation is also necessary to ensure that the practice we describe does not become routinized, and move beyond reflection, by either the teacher and/or the children and that the thinking skills learnt by children can be transferred from one year grade to the next. Consequently, we have begun a research project, the aim of which is to evaluate the success of the 'Toolbox' pedagogy across Level 3 or Grades 3 and 4. We are asking the question: Does the 'Toolbox' pedagogy foster children's intellectual development? Specifically, we want to know if, for students, there will be: improved writing skills (i.e. above expected individual levels); improved mathematical skills (i.e. above expected individual levels); greater understanding of what it means to be a 'thinker', than measured at baseline; greater motivation for learning, than measured at baseline; greater connectedness to teachers and peers, than measured at baseline; greater engagement with their learning, than measured at baseline; and whether thinking skills learnt can be transferred from Grade 3 to Grade 4 and from Grade 4 to Grade 5.

What has inspired us as practitioners is the fact that in order to learn, our children must be able to communicate effectively with their peers, teachers, parents, siblings, and so on but most importantly also with themselves. Communication really is all about making one's thoughts visible and clear, either by what we say and/or what we do, so that the other person with whom we are relating can understand us. We have

also been inspired by Otero's (2003) argument that relational learning is of value; that is, teachers should not focus on teaching content, but rather on fostering the student's relationship to the content. We best achieve that by moving away from traditional pedagogical practices that require the teacher to have the control in the learning environment to a more democratic learning environment that develops all classroom members as student, teacher and leader. Our aim should be to create independent thinkers who take responsibility for their learning and who are inspired, motivated, and challenged by their teachers and peers to continue the journey of life-long learning. As noted by Demick (2000), the time has come for the creation of mindful schools – schools that have open classrooms, promote multiple intelligences and whose teachers do not simply impart knowledge and skills through practice and repetition but who develop and cultivate mindfulness in their students as a trait (Ritchhart and Perkins 2000). Whilst we have begun this journey of creating and fostering a culture of thinking in our classrooms, we are still travelling with more to discover no doubt!

Notes on contributors

Dawn Colcott and Bernadette Russell are both primary school teachers, each with over 30 years experience. Both have taught across all year levels in primary school.

Dr Helen Skouteris is an expert in developmental psychology, who is currently working as a Research Fellow at Deakin University. Helen is also the Vice President of Bentleigh West Primary School Council.

References

- Angelides, P., and P. Gibbs. 2007. Reflections on collaborative inquiry in Cyprus: Lessons for researchers and practitioners. *Teacher Development* 11: 59–75.
- Baillargeon, R. 1994. How do infants learn about the physical world? *Current Directions in Psychological Science* 3: 133–40.
- Beijaard, D., F. Korthagen, and N. Verloop. 2007. Understanding how teachers learn as a prerequisite for promoting teacher learning. *Teachers and Teaching: Theory and Practice* 13, no. 2: 105–8.
- Black, P., C. Harrison, C. Lee, B. Marshall, and D. Wiliam. 2003. *Assessment for learning: Putting it into practice*. Buckingham, UK: Open Univ. Press.
- Brown, A.L., J.D. Bransford, R.A. Ferrara, and J.C. Campione. 1983. Learning, remembering, and understanding. In *Handbook of child psychology: Cognitive development*, ed. J.H. Flavell and E.M. Markman, vol. 3, 177–266. New York: Wiley.
- Buzan, T., and B. Buzan. 1993. *The mind map book: How to use radiant thinking to maximize your brain's untapped potential*. London: BBC Books.
- Chapman, J., R. Toomey, J. Gaff, J. McGilp, M. Walsh, E. Warren, and I. Williams. 2003. *Lifelong learning and teacher education*. Canberra, Australia: Higher Education Division, Department of Education, Science and Training (Australia) (DEST).
- Costa, A.L., and B. Kallick. 2000. *Habits of mind: A developmental series*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Del Gaudio Calyton, C., and F. Schoonmaker. 2007. What holds academically able teachers in the profession: A study of three teachers. *Teachers and Teaching: Theory and Practice* 13, no. 3: 247–67.
- Demick, J. 2000. Toward a mindful psychological science: Theory and application. *Journal of Social Issues* 56: 141–59.
- Donovan, M.S., J.D. Bransford, and J.W. Pellegrino. 1999. *How people learn: Bridging research and practice*. Washington, DC: National Academy Press.
- Ebbutt, D. 2002. The development of a research culture in secondary schools. *Educational Action Research* 10, no. 1: 123–41.

- Flavell, J. 1976. Metacognitive aspects of problem-solving. In *The nature of intelligence*, ed. L. Resnick, 231–35. Hillsdale, NJ: Erlbaum Associates.
- Fogarty, R. 2005. *Brain compatible classrooms*. Moorabbin, Victoria, Australia: Hawker Brownlow Education.
- Lin, X., and J.D. Lehman. 1999. Supporting learning of variable control in a computer-based biology environment: Effects of prompting college students to reflect on their own thinking. *Journal of Research in Science Teaching* 36: 837–58.
- Ogle, D.M. 1986. K-W-L: A teaching model that develops active reading of exploratory text. *Reading Teacher* 39: 564–70.
- Otero, G. 2003. Conversations for school improvement: The value of relational learning. Australian Principals Centre, Monograph Number 13.
- Palincsar, A.S., and A.L. Brown. 1984. Reciprocal teaching of comprehension monitoring activities. *Cognition and Instruction* 1: 117–75.
- Perkins, D.N. 2003. Making thinking visible. New Horizons for Learning. <http://www.newhorizons.org/strategies/thinking/perkins.htm>.
- Ponte, P., D. Bejjard, and A. Ax. 2004. Don't wait till the cows come home: Action research and initial teacher education in three different countries. *Teachers and Teaching: Theory and Practice* 10, no. 6: 591–621.
- Ritchhart, R., P. Palmer, M. Church, and S. Tishman. 2006. Thinking routines: Establishing patterns of thinking in the classroom. Paper presented at the American Educational Research Association conference, April, in San Francisco, California.
- Ritchhart, R., and D. Perkins. 2000. Life in the Mindful Classroom: Nurturing the disposition of mindfulness. *Journal of Social Issues* 56: 27–47.
- Sawyer, L.B.E., and S.E. Rimm-Kaufman. 2007. Teacher collaboration in the context of the *Responsive Classroom* approach. *Teachers and Teaching: Theory and Practice* 13, no. 3: 211–45.
- Siegler, R.S., and M.A. Alibali. 2005. *Children's thinking*. 4th ed. Upper Saddle River, NJ: Pearson Education International.
- Skilbeck, M., and H. Connell. 2004. Teachers for the future: The changing nature of society and related issues for the teaching workforce. A report to the Teacher Quality and Educational Leadership Taskforce of the Ministerial Council for Education, Employment Training and Youth Affairs.
- Spelke, E.S., and E.L. Newport. 1998. Nativism, empiricism, and the development of knowledge. In *Handbook of child psychology: Vol. 1. Theoretical models of human development*, ed. R.M. Lerner, 275–340. 5th ed. New York: Wiley.
- Tishman, S., E. Jay, and D.N. Perkins. 1993. Teaching thinking dispositions: From transmission to enculturation. *Theory Into Practice* 32: 147–53.